

AMENDMENTS TO THE CLAIMS

This listing of the claims will replace all prior versions and listing of the claims in this application.

Listing of the claims:

1-5. (Canceled)

6. (Withdrawn) A hinge device for pivoting a first member and a second member to be rotatably opened and closed, said hinge device comprising a first joint member coupled with the first member in a rotation prevented condition and a second joint member coupled relatively rotatably to the first joint member and coupled with the second member in a rotation prevented condition, wherein:

a cam portion is provided to either one of the first joint member and the second joint member;

a cam engagement portion which engages with the cam portion is provided to the other of the first joint member and the second joint member of said first hinge member;

at least one of the cam portion and the cam engagement portion is provided slidably in the engagement and disengagement direction;

an engagement biasing member is provided for biasing at least one of the cam portion and the cam engagement portion in the engagement direction;

when the second member kept under the coupled and closed condition is opened to the first member, in a rotational range A1 to a predetermined open angle position P2 rotated in the open direction from the coupled and closed position P1, the cam portion and the cam engagement portion are biased by said engagement biasing member and in dropping engagement

with each other whereby a closing rotation biasing effect is generated for automatically closing the second member to the coupled and closed position P1 relative to the first member;

a rotational biasing member is provided for biasing at least one of the cam portion and the cam engagement portion in a rotational direction;

when the second member is manually rotated in the open direction relative to the first member exceeding the predetermined open angle position P2, the cam portion and the cam engagement portion are biased by the rotational biasing member and are not disengaged from each other but rotated together under the engagement condition so that the open rotational biasing effect is generated for automatically opening the second member to the predetermined open angle position P3 relative to the first member;

a retainer member for releaseably retaining said cam portion or the cam engagement portion is provided in a rotation prevented manner in either one of said first joint member and said second joint member;

under the condition that the retainer member is retained at the cam portion or the cam engagement portion, the cooperative rotation of the cam portion and the cam engagement portion by said rotational biasing member is prevented;

when the retainer member is disengaged from the cam portion or the cam engagement portion, the cooperative rotation between the cam portion and the cam engagement portion by the rotational biasing member is allowed;

the retention force of the retainer member relative to the cam portion or the cam engagement portion is set up to such a retention force that the retainer member is not disengaged from the cam portion or the cam engagement portion by the biasing force of said rotational biasing member; and

when the second member is manually rotated in the opening direction exceeding the predetermined open angle position P2 against the closing rotational biasing force by the cam portion and the cam engagement portion relative to the first member, the retainer member may be disengaged from the cam portion or the cam engagement portion.

7. (Withdrawn) A hinge device for pivoting a first member and a second member to be rotatably opened and closed, said hinge device comprising a first joint member coupled with the first member in a rotation prevented condition and a second joint member coupled relatively rotatably to the first joint member and coupled with the second member in a rotation prevented condition, wherein:

a cam portion is provided to either one of the first joint member and the second joint member;

a cam engagement portion which engages with the cam portion is provided to the other of the first joint member and the second joint member of said first hinge member;

at least one of the cam portion and the cam engagement portion is provided slidably in the engagement and disengagement direction;

an engagement biasing member is provided for biasing at least one of the cam portion and the cam engagement portion in the engagement direction;

when the second member kept under the coupled and closed condition is opened to the first member, in a rotational range A1 to a predetermined open angle position P2 rotated in the open direction from the coupled and closed position P1, the cam portion and the cam engagement portion are biased by said engagement biasing member and in dropping engagement with each other whereby a closing rotation biasing effect is generated for automatically closing the second member to the coupled and closed position P1 relative to the first member;

a rotational biasing member is provided for biasing at least one of the cam portion and the cam engagement portion in a rotational direction;

when the second member is manually rotated in the open direction relative to the first member exceeding the predetermined open angle position P2, the cam portion and the cam engagement portion are biased by the rotational biasing member and are not disengaged from each other but rotated together under the engagement condition so that the open rotational biasing effect is generated for automatically opening the second member to the predetermined open angle position P3 relative to the first member;

in a rotational range A2 to the predetermined open angle position P2 rotated in the closing direction from a position where the second member is opened to the first member, the cam portion and the cam engagement portion are disengaged from each other;

an apex portion of the cam portion and an apex portion of the cam engagement portion are in abutment with each other by the bias of the engagement biasing member to generate a frictional resistance to thereby generate a free stop effect for holding the second member to the first member at any desired open angle position;

a retainer member for releaseably retaining said cam portion or the cam engagement portion is provided in a rotation prevented manner in either one of said first joint member and said second joint member;

under the condition that the retainer member is retained at the cam portion or the cam engagement portion, the cooperative rotation of the cam portion and the cam engagement portion by said rotational biasing member is prevented;

when the retainer member is disengaged from the cam portion or the cam engagement portion, the cooperative rotation between the cam portion and the cam engagement portion by the rotational biasing member is allowed;

the retention force of the retainer member relative to the cam portion or the cam engagement portion is set up to such a retention force that the retainer member is not disengaged from the cam portion or the cam engagement portion by the biasing force of said rotational biasing member; and

when the second member is manually rotated in the opening direction exceeding the predetermined open angle position P2 against the closing rotational biasing force by the cam portion and the cam engagement portion relative to the first member, the retainer member may be disengaged from the cam portion or the cam engagement portion.

8. (Withdrawn) The hinge device according to claim 6, further characterized in that an engagement concave portion for fitting and retaining said retainer member is provided in said cam portion or said cam engagement portion, and a taper surface is formed in an insertion portion of the retainer member to be inserted into said engagement concave portion whereby a retention force of the retainer member to said engagement concave portion is set up to such a retention force that the retainer member is disengaged from the cam portion or the cam engagement portion when the second member is manually rotated relative to the first member in the open direction exceeding the predetermined open angle position P2 against the closing rotation biasing force by the cam portion and the cam engagement portion.

9. (Withdrawn) The hinge device according to claim 6, further characterized in that said retainer member is slidably moved by a depression operation of a depression button portion so that the retention to said closing structure portion is released.

10-12. (Canceled)

13. (Previously presented) A hinge device for rotatably pivoting a first member and a second member open and closed, said hinge device comprising:

a first hinge member provided in a first pivot portion provided in either one of a right and a left side of a pivot joint portion between said first member and said second member and a

second hinge member provided in a second pivot portion provided opposite the first pivot portion, wherein said first hinge member comprises a first joint member coupled to the first member or the second member and a second joint member coupled to the second member or the first member, wherein when said first joint member is coupled to said first member, said second joint member is coupled to said second member and vice-versa;

a cam portion operatively connected to either one of the first joint member and the second joint member of said first hinge member;

a cam engagement portion which engages with the cam portion operatively connected to the other of the first joint member and the second joint member of said first hinge member not connected to the cam portion;

at least one of the cam portion and the cam engagement portion adapted to slidably move in an engagement and disengagement direction;

an engagement biasing member for biasing at least one of the cam portion and the cam engagement portion in the engagement direction

wherein when the second member is in a coupled and closed position and is rotated from the coupled and closed position to a predetermined open angle position the cam portion and the cam engagement portion are biased by said engagement biasing member and engage each other whereby a closing rotation biasing effect is generated to automatically urge the second member to the coupled and closed position;

a rotational biasing member in said second hinge member operatively connected to at least one of said cam portion and said cam engagement portion for biasing at least one of the cam portion and the cam engagement portion in a rotational direction

wherein the cam portion and the cam engagement portion are biased by the rotational biasing member and are not disengaged from each other but rotated together so that an open

rotational biasing effect is generated to automatically open the second member to a second predetermined open angle position; and

a retainer member for releaseably engaging said cam portion or the cam engagement portion is provided in either one of said first joint member and said second joint member of said first hinge member

and wherein when the retainer member is engaged at the cam portion or the cam engagement portion, the cooperative rotation of the cam portion and the cam engagement portion by said rotational biasing member is prevented

and wherein when the retainer member is disengaged from the cam portion or the cam engagement portion, the cooperative rotation between the cam portion and the cam engagement portion by the rotational biasing member is allowed, wherein

said retainer member is slidably moved by depressing a button provided in either one of the first joint member and the second joint member so that the engagement to said cam portion or the cam engagement portion is released.

14. (Previously presented) A hinge device for rotatably pivoting a first member and a second member open and closed, said hinge device comprising:

a first hinge member provided in a first pivot portion provided in either one of a right and a left side of a pivot joint portion between said first member and said second member and a second hinge member provided in a second pivot portion provided opposite the first pivot portion, wherein said first hinge member comprises a first joint member coupled to the first member or the second member and a second joint member coupled to the second member or the first member, wherein when said first joint member is coupled to said first member, said second joint member is coupled to said second member and vice-versa;

a cam portion operatively connected to either one of the first joint member and the second joint member of said first hinge member;

a cam engagement portion which engages with the cam portion operatively connected to the other of the first joint member and the second joint member of said first hinge member not connected to the cam portion;

at least one of the cam portion and the cam engagement portion adapted to slidably move in an engagement and disengagement direction;

an engagement biasing member for biasing at least one of the cam portion and the cam engagement portion in the engagement direction

wherein when the second member is in a coupled and closed position and is rotated from the coupled and closed position to a predetermined open angle position the cam portion and the cam engagement portion are biased by said engagement biasing member and engage each other whereby a closing rotation biasing effect is generated to automatically urge the second member to the coupled and closed position;

a rotational biasing member in said second hinge member operatively connected to at least one of said cam portion and said cam engagement portion for biasing at least one of the cam portion and the cam engagement portion in a rotational direction

wherein the cam portion and the cam engagement portion are biased by the rotational biasing member and are not disengaged from each other but rotated together so that an open rotational biasing effect is generated to automatically open the second member to a second predetermined open angle position

wherein in a rotational range to the predetermined open angle position rotated in the closing direction from the second predetermined open angle position, the cam portion and the cam engagement portion are disengaged from each other;

an apex portion of the cam portion and an apex portion of the cam engagement portion urged in abutment with each other by the bias of the engagement biasing member to generate a frictional resistance for holding the second member to the first member at any desired open angle position; and

a retainer member for releaseably engaging said cam portion or the cam engagement portion is provided in either one of said first joint member and said second joint member of said first hinge member

and wherein when the retainer member is engaged at the cam portion or the cam engagement portion, the cooperative rotation of the cam portion and the cam engagement portion by said rotational biasing member is prevented

and wherein when the retainer member is disengaged from the cam portion or the cam engagement portion, the cooperative rotation between the cam portion and the cam engagement portion by the rotational biasing member is allowed

said retainer member is slidably moved by depressing a button provided in either one of the first joint member and the second joint member so that the engagement to said cam portion or the cam engagement portion is released.

15-18. (Canceled)

19. (Currently amended) A hinge device for rotatably pivoting a first member and a second member open and closed, said hinge device comprising:

a first hinge member provided in a first pivot portion provided in either one of a right and a left side of a pivot joint portion between said first member and said second member and a second hinge member provided in a second pivot portion provided opposite the first pivot portion, wherein said first hinge member comprises a first joint member coupled to the first member or the second member and a second joint member coupled to the second member or the

first member, wherein when said first joint member is coupled to said first member, said second joint member is coupled to said second member and vice-versa;

a cam portion operatively connected to either one of the first joint member and the second joint member of said first hinge member;

a cam engagement portion which engages with the cam portion operatively connected to the other of the first joint member and the second joint member of said first hinge member not connected to the cam portion;

at least one of the cam portion and the cam engagement portion adapted to slidably move in an engagement and disengagement direction;

an engagement biasing member for biasing at least one of the cam portion and the cam engagement portion in the engagement direction

wherein when the second member is in a coupled and closed position and is rotated from the coupled and closed position to a predetermined open angle position the cam portion and the cam engagement portion are biased by said engagement biasing member and engage each other whereby a closing rotation biasing effect is generated to automatically urge the second member to the coupled and closed position;

a rotational biasing member in said second hinge member operatively connected to at least one of said cam portion and said cam engagement portion for biasing at least one of the cam portion and the cam engagement portion in a rotational direction

wherein when the second member is annually manually rotated in a range exceeding the predetermined open angle position, the cam portion and the cam engagement portion are biased by the rotational biasing member and are not disengaged from each other but rotated together-so that an open rotational biasing effect is generated to automatically open the second member to a second predetermined open angle position; and

a retainer member for releaseably engaging said cam portion or the cam engagement portion is provided in either one of said first joint member and said second joint member of said first hinge member, wherein when the retainer member engages the cam portion or the cam engagement portion, the cooperative rotation of the cam portion and the cam engagement portion by said rotational biasing member is prevented

and wherein when the retainer member is disengaged from the cam portion or the cam engagement portion, cooperative rotation between the cam portion and the cam engagement portion by the rotational biasing member is allowed

and wherein a retention force of the retainer member to said cam portion or said cam engagement portion is established such that the retainer member is not disengaged from the cam portion or the cam engagement portion by the biasing force of said rotational biasing member and wherein the retainer member may be disengaged from the cam portion or the cam engagement portion when the second member is manually rotated in a range exceeding the predetermined open angle position against the closing rotational biasing force by said cam portion and said cam engagement portion relative to said first member.

20. (Previously presented) A hinge device for rotatably pivoting a first member and a second member open and closed, said hinge device comprising:

a first hinge member provided in a first pivot portion provided in either one of a right and a left side of a pivot joint portion between said first member and said second member and a second hinge member provided in a second pivot portion provided opposite the first pivot portion, wherein said first hinge member comprises a first joint member coupled to the first member or the second member and a second joint member coupled to the second member or the first member, wherein when said first joint member is coupled to said first member, said second joint member is coupled to said second member and vice-versa;

a cam portion operatively connected to either one of the first joint member and the second joint member of said first hinge member;

a cam engagement portion which engages with the cam portion operatively connected to the other of the first joint member and the second joint member of said first hinge member not connected to the cam portion;

at least one of the cam portion and the cam engagement portion adapted to slidably move in an engagement and disengagement direction;

an engagement biasing member for biasing at least one of the cam portion and the cam engagement portion in the engagement direction, wherein when the second member is in a coupled and closed position and is rotated from the coupled and closed position to a predetermined open angle position the cam portion and the cam engagement portion are biased by said engagement biasing member and engage each other whereby a closing rotation biasing effect is generated to automatically urge the second member to the coupled and closed position;

a rotational biasing member in said second hinge member operatively connected to at least one of said cam portion and said cam engagement portion for biasing at least one of the cam portion and the cam engagement portion in a rotational direction, wherein when the second member is manually rotated in a range exceeding to the predetermined open angle position, the cam portion and the cam engagement portion are biased by the rotational biasing member and are not disengaged from each other but rotated together so that an open rotational biasing effect is generated to automatically open the second member to a second predetermined open angle position and wherein in a rotational range to the predetermined open angle position rotated in the closing direction from the second predetermined open angle position, the cam portion and the cam engagement portion are disengaged from each other;

an apex portion of the cam portion and an apex portion of the cam engagement portion urged in abutment with each other by the bias of the engagement biasing member to generate a

frictional resistance for holding the second member to the first member at any desired open angle position; and

a retainer member for releaseably engaging said cam portion or the cam engagement portion is provided in either one of said first joint member and said second joint member of said first hinge member and wherein when the retainer member is engaged with the cam portion or the cam engagement portion, the cooperative rotation of the cam portion and the cam engagement portion by said rotational biasing member is prevented and wherein when the retainer member is disengaged from the cam portion or the cam engagement portion, the cooperative rotation between the cam portion and the cam engagement portion by the rotational biasing member is allowed, and wherein a retention force of the retainer member to said cam portion or said cam engagement portion is established such that the retainer member is not disengaged from the cam portion or the cam engagement portion by the biasing force of said rotational biasing member wherein the retainer member may be disengaged from the cam portion or the cam engagement portion when the second member is manually rotated in a range exceeding the predetermined open angle position against the closing rotational biasing force by said cam portion and said cam engagement portion relative to said first member.

21. (Previously presented) The hinge device according to claim 19, further characterized in that an engagement concave portion for fitting and retaining said retainer member is provided in said cam portion or said cam engagement portion, and a taper surface is formed in an insertion portion of the retainer member to be inserted into said engagement concave portion whereby a retention force between the retainer member and said engagement concave portion is established such that the retainer member is disengaged from the cam portion or the cam engagement portion when the second member is manually rotated relative to the first member in the open direction exceeding the predetermined open angle position against the closing rotation biasing force by the cam portion and the cam engagement portion.

22. (Withdrawn) An electronic equipment using the hinge device according claim 6, wherein a body portion provided with an operating portion and a joint portion provided with a

display image field are coupled with each other and disposed to cover the operating portion when said operating portion is not operative, having a hinge device for coupling said body portion and said joint portion rotatably so that said joint portion is rotated horizontally or in a rising manner from the coupled condition to expose the operating portion or the joint portion may be rotated around its own axis to be turned inside out, and wherein said body portion is used as said first member or said second member and said joint portion is used as said second member or said first member in this hinge device.

23. (Withdrawn) The hinge device according to claim 7, wherein an engagement concave portion for fitting and retaining said retainer member is provided in said cam portion or said cam engagement portion, and a taper surface is formed in an insertion portion of the retainer member to be inserted into said engagement concave portion whereby a retention force of the retainer member to said engagement concave portion is set up to such a retention force that the retainer member is disengaged from the cam portion or the cam engagement portion when the second member is manually rotated relative to the first member in the open direction exceeding the predetermined open angle position P2 against the closing rotation biasing force by the cam portion and the cam engagement portion.

24. (Withdrawn) The hinge device according to claim 7, wherein said retainer member is slidingly moved by a depression operation of a depression button portion so that the retention to said closing structure portion is released.

25. (Previously presented) The hinge device according to claim 20, wherein an engagement concave portion for fitting and retaining said retainer member is provided in said cam portion or said cam engagement portion, and a taper surface is formed in an insertion portion of the retainer member to be inserted into said engagement concave portion whereby a retention force between the retainer member and said engagement concave portion is established such that the retainer member is disengaged from the cam portion or the cam engagement portion when the second member is manually rotated relative to the first member in the open direction

exceeding the predetermined open angle position P2 against the closing rotation biasing force by the cam portion and the cam engagement portion.

26. (Withdrawn) An electronic equipment using the hinge device according to claim 7, wherein a body portion provided with an operating portion and a joint portion provided with a display image field are coupled with each other and disposed to cover the operating portion when said operating portion is not operative, having a hinge device for coupling said body portion and said joint portion rotatably so that said joint portion is rotated horizontally or in a rising manner from the coupled condition to expose the operating portion or the joint portion may be rotated around its own axis to be turned inside out, and wherein said body portion is used as said first member or said second member and said joint portion is used as said second member or said first member in this hinge device.

27. (Withdrawn) An electronic equipment using the hinge device according to claim 8, wherein a body portion provided with an operating portion and a joint portion provided with a display image field are coupled with each other and disposed to cover the operating portion when said operating portion is not operative, having a hinge device for coupling said body portion and said joint portion rotatably so that said joint portion is rotated horizontally or in a rising manner from the coupled condition to expose the operating portion or the joint portion may be rotated around its own axis to be turned inside out, and wherein said body portion is used as said first member or said second member and said joint portion is used as said second member or said first member in this hinge device.

28. (Withdrawn) An electronic equipment using the hinge device according to claim 9, wherein a body portion provided with an operating portion and a joint portion provided with a display image field are coupled with each other and disposed to cover the operating portion when said operating portion is not operative, having a hinge device for coupling said body portion and said joint portion rotatably so that said joint portion is rotated horizontally or in a rising manner from the coupled condition to expose the operating portion or the joint portion may be rotated around its own axis to be turned inside out, and wherein said body portion is used as said first

member or said second member and said joint portion is used as said second member or said first member in this hinge device.

29. (Previously presented) An electronic device incorporating the hinge device according to claim 13, wherein a body portion provided with an operating portion and a joint portion provided with a display image field are coupled with each other and disposed to cover the operating portion when said operating portion is not operative, said hinge device rotatably coupling said body portion and said joint portion so that said joint portion rotates to expose the operating portion or the joint portion may be rotated around its own axis, and wherein said body portion comprises said first member or said second member and said joint portion comprises said second member or said first member in said hinge device.

30. (Previously presented) An electronic device incorporating the hinge device according to claim 14, wherein a body portion provided with an operating portion and a joint portion provided with a display image field are coupled with each other and disposed to cover the operating portion when said operating portion is not operative, said hinge device rotatably coupling said body portion and said joint portion so that said joint portion rotates to expose the operating portion or the joint portion may be rotated around its own axis and wherein said body portion comprises said first member or said second member and said joint portion comprises said second member or said first member in said hinge device.

31. (Previously presented) An electronic device incorporating the hinge device according to claim 19, wherein a body portion provided with an operating portion and a joint portion provided with a display image field are coupled with each other and disposed to cover the operating portion when said operating portion is not operative, said hinge device rotatably coupling said body portion and said joint portion so that said joint portion rotates to expose the operating portion or the joint portion may be rotated around its own axis, and wherein said body portion comprises said first member or said second member and said joint portion comprises said second member or said first member in said hinge device.

32. (Currently amended) An electronic device incorporating the hinge device according to claim 20, wherein a body portion provided with an operating portion and a joint portion provided with a display image field are coupled with each other and disposed to cover the operating portion when said operating portion is not operative, said hinge device rotatably coupling said body portion and said joint portion so that said joint portion rotates to expose the operating portion or the joint portion may be rotated around its own axis, and wherein said body portion comprises said first member or said second member and said joint portion comprises said second member or said first member in said hinge device.

33. (Currently amended) An electronic device incorporating the hinge device according to claim 21, wherein a body portion provided with an operating portion and a joint portion provided with a display image field are coupled with each other and disposed to cover the operating portion when said operating portion is not operative, said hinge device rotatably coupling said body portion and said joint portion so that said joint portion rotates to expose the operating portion or the joint portion may be rotated around its own axis, and wherein said body portion comprises said first member or said second member and said joint portion comprises said second member or said first member in said hinge device.